

76. The processing chamber of claim 1, wherein the second plate may be textured to increase the surface area of the second plate.

77. (Amended) The processing chamber of claim 29, wherein the first member and the second member coupled to one another comprise one piece, wherein the cooling channels are formed laterally therethrough.

78. (Cancelled) The processing chamber of claim 29, wherein the plate assembly comprises a first member and a second member coupled to one another, the second member having a bottom surface disposed at least partially in the enclosure and the first member having an upper surface connected to a support frame and one or more cooling channels disposed at least partially in the first member and located between the first member and the second member.

79. The processing chamber of claim 33, further comprising one or more baffle plates disposed between the backing plate and the second electrode.

80. (Amended) The processing chamber of claim 29, wherein the one or more cooling channels are disposed in both the first member and the second member.

REMARKS

This is intended as a full and complete response to the Final Office Action dated May 7, 2002, having a shortened statutory period for response set to expire on August 7, 2002. Claims 1, 4-15, 29-34, 41-51, and 71-80 are pending in the application. Claims 1, 4-15, 29-34, 41-51 and 71-80 were considered and stand rejected by the Examiner. Applicants cancel claims 71 and 78, without prejudice. Claim 29 has been amended to clarify the claimed subject matter. Claim 42 has been rewritten in independent form. Applicants believe that no new matter has been introduced in this response and the amendments to the claims do not raise new issues or require a new search.

Claims 29-34, 41-44, 46-51, 71, and 79 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Degner, et al* (U.S. Patent No. 5,074,456). The Examiner states that *Degner et al.* shows the invention as claimed, discloses the materials of claims 31-32, 34, and 47-51, and discloses baffle plates disposed between a backing plate and second electrode of claim 79. Applicants respectfully traverse this rejection.

Degner et al. discloses an electrode plate 12 coupled to a support frame 14 disposed in a processing chamber, with the electrode plate 12 having a lower surface exposed in the processing chamber. The support frame 14 is coupled to a backing plate 80. Apertures 16 are formed in the electrode plate 12 to allow processing gases to flow therethrough from a gas panel 70 to the processing chamber. The processing gases are feed to the electrode plate 12 by a central passage 86 formed in the backing plate 80. A cooling water source is coupled to a cooling channel 84 formed in the upper surface of a backing plate 80 and the cooling channel 84 is sealed by a ring plate 64. The backing plate 80 is disposed between the cooling channel 84 and the electrode plate 12, and the cooling channel 84 is not in direct contact with the electrode plate 12, and does not provide direct cooling the electrode plate 12. (See, Col. 8, lines 5-47, and Figure 4.)

Degner et al. does not teach, show or suggest a chamber cover having a plate assembly comprising a first member and a second member coupled to one another, the second member having a bottom surface disposed at least partially in the enclosure and the first member having an upper surface connected to a support frame and one or more cooling channels disposed at least partially in the plate assembly, wherein the one or more cooling channels are disposed at least partially in the first member and located between the first member and the second member, as recited in amended claim 29, and claims dependent thereon.

Further, *Degner et al.* does not teach, show or suggest a chamber cover facing a workpiece support, the chamber cover comprising a backing plate and a facing plate comprising an electrode, the facing plate having at least one cooling channel disposed in the facing plate and defining one or more fluid pathways distributed over the area of the electrode, as recited in amended claim 41.

Further, The subject matter of claims 41 and 71 has been added to claim 42. As amended, claim 42 recites a chamber cover comprising a backing plate and a facing plate comprising a first plate, a second plate sealably engaged with the first plate, and at least one cooling channel disposed at least partially between the first and second plates, wherein the second plate comprises an electrode and the at least one cooling channel defines one or more cooling pathways distributed over the area of the facing plate, as recited in amended claim 42 and claims dependent thereon. *Degnar et al.* does not teach, show or suggest the combination of elements by which cooling is provided directly to the electrode. Withdrawal of the rejection is respectfully requested.

Claims 1, 4-9, and 11-15 stand rejected under 35 U.S.C. § 102(e) as being anticipated by, or alternatively, under 35 U.S.C. § 103(a) as unpatentable over, *Lei et al.* (U.S. Patent No. 5,968,276). The Examiner asserts that *Lei et al.* discloses the invention as claimed. Applicants respectfully traverse this rejection.

Lei et al. discloses a gas distribution plate 24 having an annular coolant liquid passage 94 formed as a sealed annular groove around the circumference of the gas distribution plate 24. The annular groove 94 is sealed by a mating ring disposed on top of the annular groove 94 and which further provides an inlet port 96 and outlet port 98 communicating with the annular groove 94. (See, Col. 5, lines 53-63, and Figures 9-10.)

Lei et al. does not teach, show or suggest a chamber cover, comprising a retaining ring having one or more feedthrough channels formed therein, one or more feedthroughs disposed in the one or more feedthrough channels, and a lid assembly connected to the retaining ring by the one or more feedthroughs, the lid assembly comprising a first plate and a second plate connected together and defining a fluid channel therebetween, and a fluid inlet and outlet fluidly connected to the fluid channel, wherein the one or more feedthroughs enable fluid flow into and out of the fluid inlet and fluid outlet, as recited in claim 1 and claims dependent thereon. Therefore, *Lei et al.* does not teach, show or suggest the claimed subject matter. Withdrawal of the rejection is respectfully requested.

Claims 1, 4-15, 45, 72-78, and 80 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Degner et al.* (U.S. Patent No. 5,074,456) in view *Lei et al.*

(U.S. Patent No. 5,968,276). The Examiner asserts that it would have been obvious to modify the apparatus disclosed by *Degner et al.* as to further comprise the claimed feedthrough because the arrangement provides for increased liquid flow and allows maintenance or disassembly of the feedthrough without breaking the seal on the coolant system as described by *Lei et al.* The Examiner further states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by *Degner et al.* and *Lei et al.* to make the first and second plates comprise a portion of the fluid channel and to have a passageway surface area of at least about 35% of the surface area of the lid. Additionally, the Examiner states that it would have been obvious to modify the apparatus disclosed by the *Degner et al.* and *Lei et al.* references to texture a plate and to comprise a one piece plate assembly. Applicants respectfully traverse this rejection.

Degner et al. and *Lei et al.* are described and distinguished above. Further, *Degner et al.* discloses back plate cooling for a gas distribution plate by a cooling channel formed in an upper surface of a backing plate and covered by a ring plate to form a cooling duct for receiving cooling water from a source. *Lei et al.* discloses back plate cooling for a gas distribution plate by a coolant liquid pool defined between two parallel plates in a substantially annular chamber or by a sealed annular groove disposed in a chamber wall, ring member, or lid around the circumference of the gas distribution plate.

Thus, the combination of *Degner et al.* and *Lei et al.* do not teach, show, or suggest a chamber cover, comprising a retaining ring having one or more feedthrough channels formed therein, one or more feedthroughs disposed in the one or more feedthrough channels, and a lid assembly connected to the retaining ring by the one or more feedthroughs, the lid assembly, comprising a first plate and a second plate connected together and defining a fluid channel therebetween, and a fluid inlet and outlet fluidly connected to the fluid channel, wherein the one or more feedthroughs enable fluid flow into and out of the fluid inlet and fluid outlet, as recited in claim 1 and claims dependent thereon.

Further, the combination of *Degner et al.* and *Lei et al.* do not teach, show, or suggest a chamber cover having a plate assembly comprising a first member and a

second member coupled to one another, the second member having a bottom surface disposed at least partially in the enclosure and the first member having an upper surface connected to a support frame and one or more cooling channels disposed at least partially in the plate assembly, wherein the one or more cooling channels are disposed at least partially in the first member and located between the first member and the second member, as recited in amended claim 29, and claims dependent thereon.

Additionally, the combination of *Degner et al.* and *Lei et al.* do not teach, show, or suggest a chamber cover comprising a backing plate and a facing plate comprising a first plate, a second plate sealably engaged with the first plate, and at least one cooling channel disposed at least partially between the first and second plates, wherein the second plate comprises an electrode and the at least one cooling channel defines one or more cooling pathways distributed over the area of the facing plate, as recited in amended claim 42 and claims dependent thereon.

As claims 4-15 and 72-76, claims 77-78 and 80, and claim 45, depend from independent claims 1, 29, and 42, respectively, Applicants believe that claims 4-15 and 45 are patentable for at least the same reasons as argued above for independent claims 1, 29, and 42. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of the claims.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the claimed aspects of the invention. Having addressed all issues set out in the office action, applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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APPENDIX

1. (Thrice Amended) A processing chamber, comprising:
 - a) a chamber body having a substrate support member disposed therein;
 - b) a chamber cover, comprising:
 - i) a retaining ring having one or more feedthrough channels formed therein;
 - ii) one or more feedthroughs disposed in the one or more feedthrough channels; and
 - iii) a lid assembly connected to the retaining ring by the one or more feedthroughs, the lid assembly[,] comprising:
 - a) a first plate and a second plate connected together and defining a fluid channel therebetween; and
 - b) a fluid inlet and outlet fluidly connected to the fluid channel, wherein the one or more feedthroughs enable fluid flow into and out of the fluid inlet and fluid outlet.
29. (Thrice Amended) A processing chamber, comprising:

an enclosure having a first electrode for supporting a substrate in the enclosure;

and

a chamber cover having a second electrode opposed to the first electrode, the second electrode comprising:

a plate assembly [having a bottom surface disposed at least partially in the enclosure and an upper surface connected to a support frame,] comprising a first member and a second member coupled to one another, the second member having a bottom surface disposed at least partially in the enclosure and the first member having an upper surface connected to a support frame; and

one or more cooling channels disposed at least partially in the plate assembly, wherein the one or more cooling channels are disposed at least partially in the first member and located between the first member and the second member; and

- one or more fluid connectors fluidly connected to the one or more cooling channels.

41. (Thrice Amended) A processing chamber for processing a workpiece, comprising:

a workpiece support; and

a chamber cover facing said workpiece support, the chamber cover comprising:

a backing plate; and

a facing plate comprising an electrode, the facing plate having at least one cooling channel disposed therein and defining one or more cooling pathways distributed over the area of the facing plate.

42. (Thrice Amended) [The chamber of claim 71,] A processing chamber for processing a workpiece, comprising:

a workpiece support; and

a chamber cover facing said workpiece support, the chamber cover comprising:

a backing plate; and

a facing plate comprising a first plate, a second plate sealably engaged with the first plate, and at least one cooling channel disposed at least partially between the first and second plates, wherein the second plate comprises an electrode and the at least one cooling channel [is disposed at least partially between the first and second plates] defines one or more cooling pathways distributed over the area of the facing plate.

46. (Thrice Amended) The chamber of claim [71] 42, wherein the one or more cooling pathways are arcuate, radial, meandering or combinations thereof.

47. (Thrice Amended) The chamber of claim [71] 42, wherein the chamber cover is comprised of a dielectric material, a conductive material, a semiconductive material, or combinations thereof.

48. (Thrice Amended) The chamber of claim [71] 42, wherein one plate is comprised of one material and the other plate is comprised of another material.

77. (Amended) The processing chamber of claim 29, wherein the [plate assembly] first member and the second member coupled to one another comprise[s] one piece, wherein the cooling channels are formed laterally therethrough.

80. (Amended) The processing chamber of claim [78] 29, wherein the one or more cooling channels are disposed in both the first member and the second member.